Drawing Amendments

Remarks

This is in response to Office Communication dated 08/03/2006. These Remarks refer to and follow the sequence and numbering of paragraphs of the Examiner's Detailed Action. Claims 19 and 22-24 remain in the application, subject to FINAL rejection and objection for a variety of reasons.

1, Section 112 -- Concern for Sufficiency – Claim 23

Paragraph 1 identifies a double inclusion of elements in Claim 23. Counsel apologizes. This has been corrected.

Paragraphs 2 & 3. Section 112-- Concern for Sufficiency of Claim 24 -- Copied for Interference

Counsel requests that the Examiner make allowances for the need to copy Claim 24 verbatim for interference with a published patent application.

The claim also stands rejected under Section 112 and prior art is cited.

The Examiner is asked to take judicial notice that "a micro-discharge gas discharge light source" may be "an array of microdischarge devices" as shown and claimed in this patent application. The claim does not demand that there

be a single point source or single lamp. As a matter of fact, Cooper et al. shows a similar microdischarge array as their light source.

Declaration of the appropriate interference is requested, even if the copied claim has not yet been allowed in either application.

Paragraph 3. Section 112 Concern for Definiteness—Claim 23

The Examiner quotes the definiteness requirement, which uses the terms "...claims particularly pointing out and distinctly claiming..."

This concern for Claim 23, apparently relies on an expectation that the amount of water will be constant. This is not so. The terms "portable," "personal," and "canteen" indicate that the device is to be carried by a person who may drink or otherwise use from the contents. The Examiner is asked to reconsider Claim 23, taking into consideration that in this sort of "Portable Apparatus for Personal Water Purification" there is no requirement, and little likelihood, that the amount of water will remain constant.

The lightweight exterior walls are separately stated in Claim 23. They are partially supported by the inner contents, which include an amount of water varying from maximum to none at all, plus the emissive gas sealed within the

microdischarge array, which is also separately stated as item b of parent Claim 19. Any remaining concern should be dispelled by item b of Claim 19 to provide an indication of how the emissive gas is contained within the sealed flexible microdischarge array. The microdischarge array forms a sort of pillow, which helps to support the exterior walls from collapse. There is utility in this, in that portability in harsh conditions may make such lightweight support advantageous.

Paragraph 4. Section 102 Anticipation Concern -- Claim 24 -- Copied for Interference

Section 102 states the law of anticipation. This law rigorously requires actual anticipation; i.e., ***all*** the elements and relationships of the invention as claimed -- in the application presented in a single reference. The Cooper et al. publication supplies the claim copied for purposes of interference. Ressler et al '768 cannot make the claim because it lacks the microdischarge array, which is an element of the claim being copied. Ressler et al '768 cannot anticipate the claim under Section 102 because it lacks the microdischarge array, which is an element of the claim being copied. Counsel urges that this concern be addressed in the Interference.

Paragraphs 4 & 5 --Section 103 -- Concern for Obviousness

The Examiner states the appropriate statute, which features the terms "not identically disclosed" and "subject matter as a whole would have been obvious." Such presumed obviousness must be to a "person having ordinary skill" and such ordinary skill must be "in the art" and "at the time." This tough decision, in practice, must define the person by job description. In practice, the tough decision is left to the Examiner and Counsel. They usually depart from the background capability and knowledge of the person having ordinary skill, and go directly to the stack of documents, typically patents. The document stack typically is very short -- a primary reference plus one or more secondary references. The primary reference must establish a combination which is not exactly the same as the invention as claimed in the application under examination. The omission may be a problem needing a better solution, or at least a different solution, from any such solution within the primary reference proper. The secondary reference must then not only provide the solution but be quite easily found. It must be suggested by the primary reference and also be within the standard reading list, the common documentation, of the exact art. Proliferation of secondary references cannot make up for the lack of a primary

reference to define the combination, and the secondary reference must be suggested by the primary reference.

Section 103(a), of course, is not an ordinary supposition. It generally requires multiple, or at least two, references. A primary reference supplies the general situation and suggests an included class of solutions. A secondary reference supplies the exact solution, which is in the class of solutions suggested by the principal reference.

This patent application deals with a quite-common need, identified in the Field of the Invention as " ... portable personal water purification system."

Obviousness and Logic

Section 103 presents a classic problem of logic. It requires two persons, the Examiner and Counsel, to consult and resolve different attitudes toward a presumption contrary to fact. The presumption is that a combination not known is legally presumed to be known. This presumption in patent law is known as Section 103 Obviousness.

Whether a single patent or single publication does or doesn't teach the invention, would have been a quick YES/NO decision under Section 102. But

there is no such single patent or single publication. Absent the quick Section 102 Anticipation decision, the patent application under examination either has an allowable claim or it does not.

Any such surviving claim is allowable, unless a Section 103 Obviousness presumption denies allowance. The Section 103 bar – if it exists -- stands or falls on whether the composite of prior art items is legally presumed as complete (albeit not having actually been completed) to make the invention as claimed "obvious." One or all of the presumed items of knowledge are conjecture on what the fabled "person of ordinary skill in the art" is presumed to know with confidence and without experimentation.

Paragraphs 4 & 5 --Section 103 -- Concern for Obviousness

The Examiner states the appropriate statute, which features the terms "...not identically disclosed ..." and "...subject matter as a whole would have been obvious..." Such presumed obviousness must be to a "..person having ordinary skill..." and such ordinary skill must be "...in the art..." and "...at the time." This tough decision, in practice, generally does not follow the origin of the statute, which must define the person by job and job description. In practice,

the tough decision is left to the Examiner and Counsel, usually departing from the background capability and knowledge of the person having ordinary skill, and going directly to the document group. The document group typically is a principal reference plus one or more secondary references. The principal reference must establish an obviousness situation if Section 103 is to deny patentability.

To create an obviousness situation, the primary reference must identify a complete invention in its specification, which invention omits a solution found in the patent application under examination. The primary reference, if patentability is to be denied, must identify a class of secondary solutions to fill the omission. This class of omission-filling solutions typically is one or two secondary references.

The currently examined patent application will already have passed the tests for utility, novelty and inventive level, or the question of obviousness would not have arisen. Patentability would already have been denied, because of Section 101 or Section 102 lack of novelty or lack of inventive level, or both. The patent application under examination creates its own utility with its own novel combination made novel by the new solution. The combination with the new

solution should be better, or at least different from, any combination within the specification of the primary reference proper. The primary reference must not have suggested the exact change to itself to make it into the combination described in the patent application being examined. The secondary reference must then be quite easily found within the documentation of the related art to complete the novel combination – as suggested in the primary reference -- so as to contribute the omitted element to the novel – but obvious because suggested – combination.

Section 103 is thus the classic problem requiring the Examiner and Counsel to consult and agree to a presumption known to be contrary to fact. If a single patent or single publication teaches the invention, there is a YES/NO decision under Section 102. In a Section 103 Obviousness situation, however, there is no such single patent or single publication. There is only a presumptive composite of two (possibly more than two) prior art items, both (or all) of which are to be conjoined by conjecture. The conjectural conjoining is based upon what the fabled "...person of ordinary skill in the art..." is presumed to do to create a composite matching the invention claimed in the patent application. This composite must occur within an aura of confidence of success, but without

experimentation. The composite must not be even considered, absent a suggestion from the primary reference e to make the joinder.

Journeyman and Master

The origins of the US patent law were in the lifetimes of Benjamin Franklin and Thomas Jefferson, both quite inventive but very different. At their time, the person of ordinary skill in the art was typically the journeyman , who would make the journey to the job site and do the job. The journeyman typically would have learned the trade as an apprentice. Neither apprentice nor journeyman was expected to invent The apprentice was expected to fetch, keep quiet and learn. The journeyman was expected to solve ordinary problems using a selection from a group of ordinary solutions known to him from his apprentice training and journeyman experience. These distinctions are still used in skilled trades such as electrician, where unions and licensing differentiate between apprentice electrician, journeyman electrician and master electrician. Franklin, a person of limited grammar school education, was so inventive that he was addressed as "Doctor Franklin." He was world famous and honored for his electrical experiments and for such inventions as bi-focal lenses, lightning rods, a sort of

humming organ made of glass cups rubbed by fingers, called the "armonica," and a remarkably efficient fireplace insert stove.

Benjamin Franklin as a youth simply bypassed the usual steps of apprentice and journeyman (except for a short apprenticeship in his primary trade of printing) and went as Dr. Franklin directly to international fame on several platforms – science, literature, government and philosophy.

Paragraph 5 Section 103, the Journeyman and Ressler et al. '768

Paragraph 5 cites Ressler et al. '768 as the primary reference, and cites the composite of Ressler et al. '768 plus one of Eden et al.'664 and Geusic et al. '803 and Benoit et al. US Publication '344 as a set of differing composites raising a concern of obviousness affecting Claim 19. Counsel asks the Examiner to withdraw Ressler et al. '768 as a primary reference. Ressler was not portable, and Ressler's water was not potable. Ressler did not use, and did not suggest that others should use, a microdischarge array. With Ressler et al. '768 withdrawn, the individual members of the set of secondary references become simply catalog items, iuseful as elements of possible combinations, but not

sufficient to form operative combinations without a primary reference as a blueprint.

The Journeyman as the Person of Ordinary Skill in the Art

To start with, the Examiner is asked to reconsider his identification of the person of ordinary skill in the art. What is the job description of such person? What, indeed, is the art?

Is the person a journeyman water purification plumber? Is he a journeyman canteen maker? Is he or she a soldier or perhaps a hiker who carries a canteen? After perhaps ten thousand years of humans carrying a spectrum of gourds to goatskin water bags to wooden canteens to military aluminum-bottle-wrapped-in-khaki canteens, does virtually everybody from Boy Scout to jungle explorer qualify as a person of ordinary skill in the art?

What about water purification?

Is the Culligan man such a person skilled in the art? What about the journeyman plumber who installs UV treatment apparatus? Was Kipling such a person skilled in the art when he wrote Gunga Din? What do the Culligan man, the journeyman plumber, and the poet know about portable personal water

purification? Possibly nothing at all. How do we characterize the person skilled in the art of personal water purification?

Everybody knows the problem! Just about everybody wants a lightweight, cheap, problem-free purifying canteen when they must carry their own drinking water. But should we go easy on the principal reference? No, because the principal reference must present not just the desire, but the framework of the combination – and at least one suggested solution for any omitted element. The principal reference, if it describes a complete and operative combination, must also suggest a substitution, within a class of particular elements, different from an element chosen. Such a substitution must lead, with confidence, to the particular solution in the patent application under examination. Any failure, and the claim is allowable.

Is There a Portable Water Purification Journeyman?

What about the installed water purification art? Is the Culligan man such a person skilled in the art, even though softening water may not actually purify the water? What about the journeyman plumber who installs permanent UV treatment apparatus? What do the Culligan man, the journeyman plumber, and

the poet know about portable personal water purification? Possibly nothing at all. How do we characterize the person skilled in such art? We simply do not do it. There is no such recognized trade as water purification canteen plumber.

Withdraw Ressler et al. '768, Which Fails as Primary Reference

Let's consider withdrawing Ressler et al. '768 as primary reference. Ressler et al. '768 fails the preamble "**Portable** apparatus for **personal** water purification." Ressler et al. '768 is not portable, is not personal and does not suggest any solution for making itself so.

Ressler et al. '768 also fails "...flexible sealed microdischarge array filled with UV-emissive gas (etc) mounted in ... said treatment chamber ...[and] ... means mounting said flexible microdischarge array inside said water treatment chamber to restrict water flow channels to effective purifying range..."

Ressler et al. '768 not only fails to suggest the solution, but directs a different solution to a different problem. Ressler et al. '768 postulates an opaque liquid. They specify "some applications such as industrial cooling fluids such as oil and water emulsions" (Column 1, lines 36-42) to be purified, and provide baffles or otherwise restrict flow. They show two pumps, one of which enforces turbulence in a separate UV Exposure Apparatus. (See Column 2,

lines 20-23) The baffles, or equivalent structure in a simpler embodiment, make sure that the flow is within effective purifying range of their UV lamp. Ressler et al. '768. also recommend returning sterilized fluid back to the main reservoir in situations where there is a circulating fluid, for example fluid used in a closed cooling system. They suggest that less-than-complete sterilization may suffice. Note that this is contra-indicated insofar as drinking water is concerned.

The Examiner has been requested to withdraw Ressler et al. '768 as a primary reference, since Ressler et al. '768 suggests contrary solutions, not the solution claimed in this patent application, and since Ressler et al. faces contrary problems. This patent application faces and solves many problems, but does not face the problems of partial sterilization of high-flow opaque industrial coolants, and does not have an excimer UV lamp in a separate UV Exposure Apparatus 16 -- as recommended by Ressler et al. '768. Ressler et al. '768 also fails as principal reference because it uses greatly differing techniques to accomplish a greatly different task. Ressler et al. '768 is not a portable personal water purifier. Ressler et al. '768 does not expect anyone to drink the water. Ressler et al. '768 does not provide a canteen. Ressler et al. '768 is not portable. Ressler et al. '768 has a separate Main Fluid Reservoir 12 and separate U.V.

Exposure Apparatus 16. Ressler et al. '768 features a Main Pump 15 to feed liquid from Main Fluid Reservoir 12 to a Use Device.

Withdraw Ressler et al. '768 as Primary Reference

With specific reference to the Examiner's suppositions beginning at the top of page 3 of the Detailed Action:

Ressler et al. '768 fails to justify the following statements:

"...**teaches a portable apparatus**..."

"...**for personal water purification...**"

"...a **flexible sealed microdischarge array** filled with UV-emissive gas ..."

"...means mounting **said flexible microdischarge array inside said water treatment chamber to restrict water flow channels to effective purifying range of such emission.**"

Ressler et al. '768 as the principal reference absolutely fails and should be withdrawn. Ressler et al. '768 could not [without experimentation] be made into a purifying canteen. Not a chance! Too big. Too heavy. Too demanding of permanent installation. Too optimized for industrial applications. Too

expensive. Too dangerous because of the breakable lamp containing gas and because of the incomplete purification. Not portable – not potable. The Examiner is requested to withdraw Ressler et al. '768 as primary reference.

With No Primary Reference, Can There Be Section 103 Obviousness?

A discussion of the state of the art fits here. With Ressler et al. '768 withdrawn, the concern then must be whether, using the general desire for a cheap, effective, lightweight, portable purifying canteen, one or a combination of the other references provides a complete solution. Professor Eden and his co-inventors at the University of Illinois do not provide a complete solution. They provide a high-quality flexible microdischarge array at operational pressures near atmospheric pressure as contrasted to the vacuum in the usual glass UV fluorescent tubes. Their microdischarge array, however useful, is only one of several elements in the purifying canteen of this patent application. While the Eden microdischarge array would be usable in a portable purifying canteen according to the teaching of this patent application, it is not a complete solution—a good component, but merely a component. So far, this discussion

shows only the general desire for a purifying canteen plus an available flexible microdischarge array available as a catalog item.

Geusic et al '803 adds another microdischarge array available as a catalog item, as an alternative to Eden.

The Examiner has been asked to withdraw the Ressler et al. '768 citation, and is also asked to consider the Eden et al. '664 and Geusic et al. '803 citations as catalog items usable in the combination but not teaching the combination.

Claims 19 and 21-24 remain.

Discussion of Claim 19 Vis-à-vis Industrial Coolant Treatments

The Examiner has already been asked to withdraw Ressler et al. '768 with respect to Claims 19 & 21-24. This discussion will proceed on the theory that there is no primary reference – only general desire for a portable purifying canteen. Ressler et al. '768, which has been discussed in detail, may be considered a treatise on the prior art in a different but analogous art – industrial coolant treatments. The industrial coolant treatment art does not have " ... a microdischarge array ..." but has a bent tubular UV lamp 34 (Fig. 4). The industrial coolant treatment art deals with the problems of radiation blocking of

ultra-violet (UV) sterilization of opaque liquids, in which the UV radiation does not penetrate well because of the opacity. The industrial coolant treatment art solution to opacity is to provide pumped turbulent flow, so as to expose all the liquid in the treatment chamber to the UV lamp. This is the well-known UV disinfection mentioned in the prior art section of this patent application. Note the distinctions of the paragraph starting at line 5 of page 7 of this application. See, especially, lines 9-12, which discusses such systems. The UV lamp would dangerously add fragility, weight and power demands in a human-portable system. Several industrial coolant treatment problems (e.g., high-volume, durability, opacity, recirculation) are not the problems of this patent application, nor are the solutions the solutions of this patent application;

Cooper et al. Publication US 2004/0144733

Cooper et al. Publication US 2004/0144733 describes a "high-pressure gas discharge device and methods of using." Claim 19, which is the generic parent claim for Claims 22-23 and is similar to interference claim 24, will be discussed in detail later in these Remarks. Note here, however, that Cooper et al. 'Publication '733 deals with a high-pressure gas discharge device

(see Abstract). See also page 4 paragraph [0069] in which " ... conventional LP (low pressure) Hg ... sources ..." are differentiated. The Examiner is asked to withdraw this citation – high pressure mercury (Hg) is dangerous to both portability and potability.

Secondary-Reference Concerns in Section 103 Obviousness

Section 103 Obviousness generally is treated as a presumption invoked by an objective recommendation for combining references to alter the combination. A primary reference alone, not sufficient as a Section 102 Anticipation, needs to contain a specific suggestion to add or substitute an element from one or more secondary references. The presumption also requires the person of ordinary skill in the art to combine elements as suggested without experimentation and with confidence in success. The traditional person of ordinary skill is the journeyman, not the master craftsman and not the apprentice.

Section 103 Obviousness typically commences with the current state of the exact art. A person of ordinary skill, being made aware somehow of some desirable improvement, might add or substitute an element. An example might be replacing an incandescent light bulb with a screw-in fluorescent light bulb.

The person of ordinary skill might be the person who monitors the industrial coolant treatment system. He might consider replacing the planar UV lamps of the industrial coolant treatment art (Ressler et al. '768 Figure 3, items 26) with the microdischarge arrays of Eden et al. '664. If he actually made the switch without such consultation, such unauthorized messing with an industrial coolant treatment art device might well cost him his job. He should have discussed such a switch with his manager. This switch might result in an industrial coolant treatment art device (for example, a diesel to drive a stand-by generator) with a perfectly acceptable different UV light source. On the other hand, the switch might cause serious damage to the stand-by generator engine, shut down the stand-by generator, and cause great secondary damage to machinery dependant on the stand-by generator for soft-landing shutdown.

Even if possible and reasonable, there is no suggestion in the industrial cooling liquid treatment art to replace the planar excimer UV lamps or the Fig. 1 UV lamp of Ressler et al '768 with any microdischarge array. It would not be easy, it would require discussion and serious calculation if not serious experimentation, and it might cause serious damage.

In any case, that is not the situation here. It still would not be portable, and it s water still would not be potable.

Other observations by the Examiner apply concerns that combinations of the industrial cooling liquid treatment art and Eden et al. '664 and Betterly et al. '913 and Benoit et al. '344 and Geusic '603 might make certain claims obvious. The particular claims fall within the group (Claims 1-18) which have been canceled. This sort of concern will be discussed later in these Remarks in discussion of Claims 19 & 21-24.

There is no intention of making the well-known evacuation-and-backfilling process into a stand-alone inventive-level process, and this no longer appears in the claims. The Xenon Iodide has advantages and is included in Claims 19 and 23.

6. The Examiner is asked to reconsider the complex rejection of Claim 22. First of all, Ressler et al '768 should by now be withdrawn as primary reference, and therefore there is no prior art to the combination, either actual or presumptive. Second of all, Claims 21 and 22 are very specifically drawn to the in-line configuration shown in Figure 1, and include details not shown in any of

the cited prior art. Such details include spiral-wound flexible microdischarge array and other items such as spacers at each end or separation assurance means.

7. The Examiner is asked to reconsider Claim 23, which is also rejected over a complex collection of prior art including Ressler et al '768 which should by now be withdrawn.

The Examiner is asked to reconsider the observation that Ressler et al '768 could be made portable by removal of four bolts. This is not what happens in the real world. Installation bolts are anathema to portability.

Counsel has personally moved a piano several times, from Indiana to DC, DC to New York, New York (in-state thrice) and New York to Connecticut Three such moves were by professional truckers; two such moves were by personal pickup truck or personal van; and one move was by hand-carrying from house to house next door.

The piano, a spinet, even has tiny wheels, but still required a trio of people to carry it house-to-house-next-door, even after removal of all easily removable panels. The trio moved the disassembled piano panel-by-panel, then the heavy body, down several steps, across a small strip of grass, up a few steps, across a threshold, across a linoleum entry foyer and kitchen linoleum floor, and across another threshold and a

carpeted room to its resting place. Then the trio reassembled the piano and played Chopsticks, the complete repertoire of the trio of piano carriers. The piano actually remained more-or-less in tune. The piano was not then and is not now – portable.

London Bridge was taken apart, the parts moved to Arizona and reconstructed. London Bridge was not then and is not now – portable. . Neither is Ressler et al.

NASA, of course, is the champion moving company. NASA moves the Space Shuttle, on a huge, powered dolly, from the Assembly Building to the Launch Pad, then fires the rockets and blows the bolts holding the shuttle down. The Space Shuttle rockets up to escape velocity, completes its mission, and re-enters the atmosphere. It may land in the west at Edwards Air Force Base, and be carried piggy-back on a jet freighter back to Cape Canaveral, hoisted back onto the dolly and rolled back to the Assembly Building for re-use. The Space Shuttle flies millions of kilometers per trip. The Space Shuttle is held down on the Launch Pad by four explosive bolts, but is not now – and never will be -- portable.

Summary and Communication Information

The Examiner is thanked for the summary a communication information in this paragraph. No additional response is required. This paragraph concludes the discussion keyed specifically to the paragraphs of the Examiner's Detailed Action.

Discussion of Remaining Claims 19 & 21-24

Claim 19 is formatted to supply not only a proper definition of the invention, but also to supply proper antecedent basis for dependent Claims 22-23. Claim 19 distinguishes from industrial coolant treatment devices (such as Ressler et al. '768) in that it integrates elements and relationships vital to a personal water purification device, featuring portability and effectiveness. Portability comes from a lightweight envelope; effectiveness comes from a flexible microdischarge array which is configured in layers to emit ultraviolet radiation penetrating the water. The typical industrial coolant treatment installation does not exhibit the characteristic of portability. Rather the typical industrial coolant treatment installation is designed for permanent industrial installation, with permanent connections to plumbing and electric systems. Ressler et al. '768 does not have a microdischarge array at all, but uses a bent

tube UV lamp in a first embodiment and a set of eight staggered planar excimer lamps in a second embodiment. Ressler et al. '768 features a pump and baffle system to provide turbulence and present the opaque fluid to the planar excimer UV lamps. The Examiner has been asked to withdraw Ressler et al. '768 as a primary reference under Section 103, since there is no teaching of a personal water purifier and since Ressler et al. '768 teaches the use of a standard UV bulb (or unstandard planar excimer lamp). The Examiner has been asked to withdraw Ressler et al. '768 as cited against 19 and 24 and by extension against its dependent Claims 22-23. Certainly, the use of the UV microdischarge array is not taught by Ressler et al. '768, and certainly there is no recommendation in Ressler et al. '768 to substitute any microdischarge array, much less a spiral-wound or otherwise layered microdischarge array.

Claim 19 stands alone and also provides a parent for dependent Claims 22-23 which provide details of the appropriate elements.

Discussion of Claim 24 Copied for Interference

This paragraph relates to Claim 24, which is copied from Claim 1 of Cooper et al. publication '733 for purposes of interference determination. This patent application was filed earlier than the filing date of Cooper et al., but Cooper et al. may have rights from an earlier application.

Claim 24 reads on Figure 1 and other figures of this application, as follows:

A system for treating a fluid comprising:

a treatment chamber (1) coupled to a fluid outlet (10), and

at least one micro-discharge gas discharge light source (5) wherein the light source is configured to expose a fluid passing through the treatment chamber to radiation.

The Examiner is requested to declare the appropriate Interference.

Ressler et al. '768 Fails as Primary Reference

The Examiner is again asked to withdraw Ressler et al. '768 for multiple failures to disclose the portable personal water purification system of this patent application.

Ressler et al. '768.fails the preamble " **Portable** apparatus for **personal** water purification." Ressler et al. '768 is not portable. Ressler et al. '768 is not personal. Ressler et al. '768 does not suggest any solution.

Ressler et al. '768 also fails multiple elements. Ressler et al. '768 fails to disclose a "...flexible sealed microdischarge array filled with UV-emissive gas [etc.} mounted in ... said treatment chamber ...[and] " ... means mounting said flexible microdischarge array inside said water treatment chamber to restrict water flow channels to effective purifying range..."

Ressler et al. '768 also fails to suggest the combination by introducing poisonous elements. Ressler et al. '768 has both a different solution and a different problem. Ressler et al. '768 postulates an opaque liquid, specifying "... some applications such as industrial cooling fluids such as oil and water emulsions..." (Column 1, lines 36-42.) Such liquids are to be purified, not consumed as drinking water. Ressler et al. '768 provide a baffled or otherwise restricted flow and actively provide turbulence enforced by a pump (See Column 2, lines 20-23.) The pump make sure that the flow is within effective purifying range of their UV lamp. Ressler et al. '768. also recommend returning sterilized fluid back to the main reservoir in situations where there is a circulating fluid, for

example fluid used in a closed cooling system, and suggest that less-than-complete sterilization may suffice (Column bbb, line ccc). Note that less-than-complete sterilization is contra-indicated insofar as drinking water is concerned.

The Examiner is again requested to withdraw Ressler et al. '768 as a primary reference, since Ressler et al. '768 suggests contrary solutions, not the solution claimed in this patent application, and since Ressler et al. faces contrary problems. This patent application faces and solves many problems, but does not face the problems of partial sterilization of high-flow opaque industrial coolants, and does not have an excimer UV lamp in a separate UV exposure apparatus 16 as recommended by Ressler et al. '768.

It is not a pejorative comment to state that Ressler et al. '768 fails as principal reference because it uses greatly differing techniques to accomplish a greatly different task. Ressler et al. '768 is not a portable personal water purifier. Ressler et al. '768 does not expect anyone to drink the water. Ressler et al. '768 does not provide a canteen. Ressler et al. '768 is not portable. Ressler et al. '768 has a separate Main Fluid Reservoir 12 and separate UV Exposure Apparatus 16. Ressler et al. '768 features a Main Pump 15 to feed liquid from Main Fluid Reservoir 12 to a Use Device.

With specific reference to the Examiner's observations beginning at the top of page 4 of the Detailed Action,

Ressler et al. '768 fails to justify the following statements:

"...**teaches a portable apparatus**..."

"...**for personal water purification...**"

"...a **flexible sealed microdischarge array** filled with UV-emissive gas ..."

"...means mounting **said flexible microdischarge array inside said water treatment chamber to restrict water flow channels to effective purifying range of such emission.**"

The principal reference absolutely fails. Nobody can believe that Ressler et al. '768 could [without experimentation but with confidence] be made into a purifying canteen. Not a chance! Too big. Liquid flow rate 480 gpm past the lamp is too great. Too heavy. Too demanding of permanent installation. Too optimized for industrial applications. Too expensive. Too dangerous because of the breakable lamp containing gas, not to mention poisonous fluids such as ethylene glycol used for industrial cooling. The Examiner has already stated that

Ressler et al. "...does not teach the array being flexible, the gas being 1-2 atm or the emission range of 250-26- nm." The Examiner is requested to withdraw Ressler et al. '768 as primary reference. These things are not inconsequential. Ressler et al. does one thing one way – permanently-mounted UV-lamp-exposure of opaque fluid to reduce bacteria to a level acceptable for an industrial use, using a reservoir, a treatment chamber separate from the reservoir, and a pump. The Ressler et al. installation is doubtless useful -- but certainly not a purifying canteen. This would be like using a pipeline as a baby bottle. The Examiner is asked to withdraw Ressler et al. as the primary reference. The Examiner is also asked to withdraw the observation that Ressler et al. could be made portable by removing four bolts. This is not an appropriate argument for personal portability.

With Ressler et al. '768 withdrawn, the concern then must be whether it is proper, for purposes of developing Section 103 Obviousness, to use the general desire for a cheap, effective, lightweight, portable canteen as the primary reference, and then to add the exact purifying mechanism of this patent application. None of the other references provides a complete framework.

The first issue to add to this ancient canteen is any purifying mechanism. Even if one should postulate the desire, and maybe even postulate adding some chlorine bleach or sodium hypochlorite pills, the issue would remain whether the inventors here are merely installing a known purifying mechanism in a known canteen configuration. This is not the situation here.

Professor Eden and his co-inventors at the University of Illinois do not provide a complete solution. They provide a high-quality flexible microdischarge array which can operate at operational pressures near atmospheric pressure as contrasted to the vacuum in the usual glass UV fluorescent tubes. Their microdischarge array, while remarkable, is merely a catalog component to be purchased by others to install as desired. Professor Eden and his group do not suggest the use of their flexible microdischarge array in a purifying canteen such as that shown in this patent application. While the microdischarge array might even be usable in a portable purifying canteen according to the teaching of this patent application, it is not a complete solution—a great catalog component, but merely a catalog component until properly mounted within the reservoir chamber.

So far, we have only the general desire for a canteen (replacement for Ressler et al. '768 as primary reference) plus a general desire for potable water from such canteen, plus an available Eden flexible microdischarge array available as a catalog item.

Geusic adds another microdischarge array available as a catalog item replacement for Eden et al. Geusic uses pressures in the range of 1-2 atm.

Benoit shows use of Xenon Iodide in a microdischarge array.

Note, however, that there are a number of available microdischarge arrays operating at a number of pressures with differing voltages and with differing emissive gases. Emission dimensions are important, because of radiation effectiveness as a function of travel through water.

Portability Reality

Realities of portability are powerful. In the purifying canteen, or in the purifying pipe extender, power adaptability must be supplied which is lightweight and safe both to persons and components. Filtering is important. The common nature of these features does not necessarily make their most desirable combination obvious. Even so, there might be a level of invention problem if this

were the sole claim to novelty and inventive merit. There are other features of novelty and inventive merit, however, particularly in the use of a flexible UV microdischarge array spiral-wound with spacers.

Microdischarge Array

The problems of UV generators generally, and in particular the realities of the microdischarge array, add a more fertile field for novelty and inventive merit.

The microdischarge array must be sealed against water infiltration or emissive gas escape. The microdischarge array must be easy to clean. The microdischarge array must be tough to resist damage. And, for the portable purifier to be effective, the rolled microdischarge array must be evenly spaced at an exact dimension appropriate for sterilization and also appropriate for water flow. In the preferred embodiment this spacing is 2.5 centimeters. This dimension is provided by "separation assurance" means. The separation assurance means shown is spiral separators 8 and 9 in Fig. 1; stiffeners 21 held in place by items 30, 30a and 30b in Fig. 13; and by chain separators 31in Fig. 15.

Realistically, the device must be inexpensive and yet durable.

Interference

One claim, Claim 24, was copied for purposes of interference. Declaration of the interference is requested.

Parent Claim 19 and three other claims remain, dealing with the realities of a portable purifying mechanism (Claim 19) mountable as purifying pipe extender (Claims 21 & 22) or as purifying canteen (Claim 23). Each of these three other claims is limited to construction details which are important to portability and yet have important differences in capacity so as to be a personal purifying canteen or a purifying pipe extender for group sharing of purified drinking water.

Summary

Claims 19, 22, 23 and 24 remain. Claims 20 and 21 have been canceled in this response. Claims 1-18 have previously been canceled. Claims 19 and 22-24 were previously submitted and discussed, written with the Examiner's earlier objections in mind.

Section 102 Anticipation of Interference Claim 24

Claim 24 was copied for purposes of Interference.

The Examiner is asked to accept Claim 24 for Interference purposes only, and defer any questions of anticipation.

Section 102 states the law of anticipation. This law rigorously requires actual anticipation; i.e., ***all*** the elements and relationships of the invention claimed in the application presented in a single reference. Even so, the copying of a claim for purposes of interference may properly be done, with Section 102 concerns deferred. The Examiner is asked to declare the interference, deferring Section 102 concerns.

Ressler et al. '768 Should Be Withdrawn

The Examiner has been asked to reconsider Ressler et al. '768 with respect to Claims 19 and 22-24. Ressler et al. '768 does not have " ... a microdischarge array ..." but has a set of bent tubular glass UV lamps 34 (Fig. 4). Ressler et al. '768 simply is not portable. If one removes the attachment bolts 48, the apparatus is no longer operable. The word "portable" would be totally

meaningless if it should be defined as encompassing destructive disassembly. Random House Webster's College Dictionary defines "portable" as follows:

"easily carried or conveyed by hand."

Ressler et al. '768 deals with the problems of radiation blocking of ultra-violet (UV) sterilization of opaque liquids. The UV radiation does not penetrate well because of the opacity. The Ressler et al. '768 solution turbulent flow, so as to expose all the liquid to the UV lamp. This is the UV disinfection mentioned in the prior art section of this patent application. Ressler et al. '768 adds turbulence to counteract the opacity by putting all the liquid within the limited range of the UV radiation of the lamp. Note the distinctions of the paragraph starting at line 5 of page 7 of this application. See, especially, lines 9-12, which discusses systems similar to that of Ressler et al. '768. The UV lamp dangerously adds fragility, weight and power problems in a human-portable system. These are not the problems of this patent application, nor are these the solutions of this patent application;

Note here, however, that Cooper et al. 'Publication '733 deals with a high-pressure gas discharge device (see Abstract). See also page 4 paragraph

[0069] in which " ... conventional LP (low pressure) Hg ... sources ..." are differentiated.

Multi- Reference Concerns for Obviousness

Section 103 defines the obviousness concern when references are combined. Section 103 Obviousness requires noting that obviousness in patent law generally is treated as a presumption requiring an objective statement. Combining multiple references generally must include a recommendation. A principle reference alone, not sufficient as a Section 102 anticipation, needs a specific suggestion to combine it with one or more supplemental references. The presumption also requires that the person of ordinary skill in the art would combine them without experimentation and with confidence in success. The traditional person of ordinary skill is the journeyman, not the master craftsman and not the apprentice.

Previous discussion was of an obviousness concern in replacement of the UV lamp of Ressler et al. '768 with the microdischarge array of Eden et al. '664. This concern will be discussed later in these Remarks for Claims 19 & 21-24.

Previous discussion concern that combinations of Ressler et al. '768 and Eden et al. '664 and Betterly et al. '913 and Benoit et al. '344 land Geusic '603 might make certain claims obvious. The particular claims fell within the group (Claims 1-18) which have been canceled. This concern will be discussed later in these Remarks in discussion of Claims 19 & 21-24.

Claim 23 specifies Xenon Iodide as the emission material. There is no intention of making the evacuation-and-backfiring process into a stand-alone inventive-level process, but the Xenon Iodide has significant non-obvious advantages. The "evacuate and backfill" process is a well-known process in making microdischarge arrays and many other gas-filled devices, and is included as a dependent claim only because Xenon Iodide is preferred. This concern will be discussed later in these Remarks in discussion of Claim 22-24 with all concerns.

Discussion of New Claims Replacing Original Claims

Claim 19 is a stand-alone claim to the invention, Claim 19 identifies elements and relationships roughly equivalent to a composite of canceled

Claims 4-8. Claim 19 is formatted to supply a proper definition of the invention, and also to supply proper antecedent basis for dependent Claims 22 & 23.

Claim 19 stands alone and also provides a parent for dependent Claims 22-23 which provide details of the appropriate elements. The prior art has been fully differentiated. Allowance is requested for Claims 19 & 21-23.

Discussion of Claim 24 -- Copying a Claim for Interference

Claim 24 was copied from Claim 1 of Cooper et al. published patent application US2004/0144733. The Examiner is requested to declare any appropriate Interference. It reads on Figure 1 and other figures of this application, as follows:

A system for treating a fluid comprising:

a treatment chamber coupled to a fluid outlet, and

at least one micro-discharge gas discharge light source wherein the light source is configured to expose a fluid passing through the treatment chamber to radiation.

The Cooper et al. pub lication was filed after the filing date of this patent application, but Cooper et al. may have rights from an earlier application. Claim 24 has been copied for purposes of Interference. Declaration of Interference is requested for Claim 24.

Entry of this Response is requested, if necessary for purposes of Interference and Appeal only.

Allowance of Claims 19 & 21-23 is requested.

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